Free Nicotine Replacement Therapy Programs vs Implementing Smoke-Free Workplaces: A Cost-Effectiveness Comparison

We compared the cost-effectiveness of a free nicotine replacement therapy (NRT) program with a statewide smoke-free workplace policy in Minnesota. We conducted 1-year simulations of costs and benefits. The number of individuals who quit smoking and the quality-adjusted life years (QALYs) were the measures of benefits. After 1 year, a NRT program generated 18 500 quitters at a cost of $7020 per quitter ($4440 per QALY), and a smoke-free workplace policy generated 10 400 quitters at a cost of $799 per quitter ($506 per QALY). Smoke-free workplace policies are about 9 times more cost-effective per new nonsmoker than free NRT programs are. Smoke-free workplace policies should be a public health funding priority, even when the primary goal is to promote individual smoking cessation. (*Am J Public Health.* 2005;95:969–975. doi: 10.2105/AJPH.2004.040667)

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INDIVIDUAL SMOKING cessation is a highly cost-effective clinical medical intervention for individual smokers[1]; nicotine replacement therapy (NRT) is a key element of this approach to combating nicotine addiction.[2] With the exception of telephone quit lines,[3] public health tobacco control programs have generally concentrated on population-based approaches, such as implementing policies that promote smoke-free workplaces. Smoke-free workplace policies not only provide an environment that encourages smokers to reduce or stop smoking but also protect nonsmokers from the toxins in environmental tobacco smoke.[4,5] The tobacco industry orchestrates opposition to smokefree workplaces[6–13]; public health officials counteract with efforts to implement smoke-free policies.

There is pressure on public health professionals to provide more tobacco control programs that are directed at individual smoking-cessation assistance. This tension was illustrated dramatically in Minnesota in 2002, when the attorney general sued the Minnesota Partnership for Action Against Tobacco (MPAAT),[12,14] a foundation that was created as part of the settlement of the state's lawsuit against the tobacco industry. The attorney general alleged that MPAAT was ignoring its mandate to "offer smoking cessation opportunities to Minnesota smokers"[15] by encouraging clean indoor-air policies rather than providing individual treatment for smoking cessation.[9] As a result of this lawsuit, MPAAT scaled back its community-based environmental-change programs and replaced them with programs that focused on individual cessation.[12,14] In England, the entire tobacco control program funded by the Department of Health is supporting individual cessation rather than promoting environmental change, such as smoke-free workplaces.[16–18]

While individual cessation programs—which should complement population-based tobacco control programs—are very cost-effective compared with other *medical* interventions, the question remains as to whether individual cessation programs are the best use of *public health* funds allocated for tobacco control programs. We compared the cost-effectiveness of a free NRT program versus a statewide smoke-free workplace campaign by examining the Minnesota case study because of its policy relevance. We assumed that a free NRT program provides only over-the-counter assistance, such as the nicotine patch and nicotine gum, and not other NRT or medications that require a prescription, such as bupropion. We found that a statewide smoke-free workplace policy was nearly 9 times more cost-effective per successful quitter generated than a free NRT program.

METHODS

We first determined the smoking population of Minnesota. One-year costs, benefits, and cost-effectiveness ratios were then simulated for a statewide free NRT program and a statewide smoke-free workplace policy. Benefits were measured in both sustained quitters generated and quality-adjusted life years (QALYs) gained. We conducted a sensitivity analysis by analyzing 3 alternative scenarios that varied key assumptions.

Estimation of Minnesota's Smoking Population

The US Census estimated the total Minnesota population aged 18 years and older to be 3 717 580 in 2001,[19] when Minnesota had a smoking prevalence of 22.2% (n=825 000).[20]

Effectiveness of a Free NRT Program

We estimated the effectiveness of a free NRT program by combining the number of new individuals likely to use NRT and the effectiveness of NRT at smoking cessation to generate the number of sustained quitters and the equivalent QALYs gained after 1 year of a free NRT program. We first estimated the number of Minnesotan smokers who were actively considering quitting, i.e., those who were in the contemplative or preparation stage of change.[21] Precontemplative smokers are

not interested in quitting and are not likely to request NRT, which had no significant effect on quitting among this population.[22] A 2003 MPAAT survey of Minnesotans found that 36% of current smokers were precontemplators, with the remainder being either contemplators or preparers.[23] We assumed that 64% (n=528 000) of the current smokers were ready to attempt smoking cessation.

Not everyone who is interested in smoking cessation will choose to use NRT. The 2003 MPAAT survey found that 80% of the current smokers who were interested in quitting would use NRT if cost were no object[23]; however, some individuals currently choose to pay for NRT. Thus, we can only describe the effectiveness of the free NRT option as the increase in users when the monetary cost of NRT to the smoker becomes zero. In the 2000 National Health Interview Survey, 15% of former and current smokers used NRT when they last attempted to quit[24]; we used this rate as the baseline NRT use rate. Thus, the net gain in NRT users obtained by providing free NRT would be 68% of potential quitters (80%×85%), or 359 000 people.

There is no consensus as to effectiveness of NRT as a cessation aid among light smokers (<15 cigarettes/day).[25] We therefore assumed in our base case analysis that NRT was not effective in helping light smokers quit. The 2000 Behavioral Risk Factors Surveillance Survey[26] estimated that 54.9% of Minnesotan smokers were moderate to heavy smokers (≥15 cigarettes/day), with the rest being light smokers. Therefore, 197 000 of the 359 000 new NRT users may have gained benefit from NRT.

The pooled odds ratio of quitting with NRT over baseline was 1.71.[27] Quitting was defined in these studies as continued cessation after 6 months for heavy smokers only. In the studies used to calculate the pooled odds ratio, the control group's average quit rate was 10.6%. Although higher than the 2.5% background quit rate seen among the general population,[28,29] we assumed that a 10.6% quit rate was a reasonable baseline quit rate for smokers interested in quitting and thus used it as our baseline for individuals who used NRT. We calculated an additional 7.5% quit rate with NRT use over baseline. Because cessation with NRT treatment was defined as abstinence after a period of 6 months,[27] we assumed 2 quit attempts were possible within 1 year and that all initial failed quitters would try NRT again. We also assumed a smoking relapse rate of 35%.[30,31]

On the basis of these assumptions, we calculated that after the implementation of a free NRT program, 14 800 individuals (197 000 individuals×7.5%) would quit smoking after 6 months, and an additional 13 700 ([197 000−14 800]×7.5%) of the remaining failed quitters would quit by the end of 1 year. Multiplying the sum of these quitters by a 35% relapse rate resulted in a total of 18 500 quitters generated after 1 year of a free NRT program.

We converted the benefits of quitting into quality-adjusted life years (QALYs) in accordance with the existing literature, which estimates that each sustained quitter generates 1.58 QALYs.[28] This estimate of 1.58 QALYs assumes that the average quitter is aged 45 years and receives the benefits of 2 QALYs[30] that cease after age 65; when a discount rate of 3% is used, the result is 1.58 QALYs. The QALYs cease after 65 years of age because the benefit of smoking cessation in life expectancy comes primarily from the prevention of early heart disease. Discounting also makes accrued benefits in years after age 65 minimal, so benefits cease around that age. Individuals who relapse are assumed to gain no QALY benefit.

Cost of a Free NRT Program

We used 2002 average wholesale prices for the most inexpensive NRTs. For nicotine gum, we used 2mg nicotine polacrilex (Rugby); prices were $40.07 for 108 pieces of this gum.[32] For nicotine patches, we used the nicotine transdermal system (Bergen Brunswig); prices were $44.80 for 14 24-hour patches.[32] We assumed the slightly lower nicotine content in the patch did not affect its smoking cessation effectiveness. We also assumed that nicotine patches would be used 2.5 times more frequently than nicotine gum on the basis of national quantity index data after over-the-counter conversion of these NRTs.[28]

The cost of a quit attempt was calculated as the product cost multiplied by the recommended duration of therapy, which was 12 weeks for nicotine gum and 8 weeks for nicotine patches.[2] With nicotine gum, the average consumer used 6 pieces a day and thus needed 504 pieces, or 5 packages of gum, to complete therapy, which cost $200.35. With nicotine patches, the total cost of therapy for 1 quit attempt was $44.80 multiplied by four 2-week packages, or $179.20. With a 2:5 ratio of gum:patch use, the average cost of a quit attempt with NRT was $185.34. This estimate did not include the costs of administering a free NRT program, such as advertising, coordination, or dispensation, or any associated counseling[2] or support through a telephone quit line.[2] We calculated the total medication cost of a free NRT program by multiplying the average cost of a NRT quit attempt with the sum of initial users plus the number of repeat users. This calculation was similar to the determination of cessation with a free NRT program; we assumed that the free NRT program could not differentiate between light and heavy smokers and that both types of smokers would equally acquire free NRT. We estimated that 359 000 smokers would receive enough NRT for 1 full quit attempt and that 6 months later the 344 000 remaining smokers would receive enough NRT for a second full quit attempt. We multiplied by the average cost of a full NRT quit attempt and found the estimated medication costs of a free NRT program for all Minnesotan smokers to be $130 million.

Effectiveness of a Smoke-Free Workplace Policy

We used the 2001 Occupational Employment Statistics Survey to estimate the number of Minnesotan indoor workers.[33] We then used methodology published elsewhere,[33,34] and subtracted those individuals who did not work indoors from the total 2001 employment (n=2 613 000). The excluded individuals included (1) parking enforcement workers, police, and sheriff's patrol officers; transit and railroad police; and crossing guards; (2) maids and house-

keeping cleaners; pest control workers; landscapers and groundskeepers; pesticide handlers, sprayers, and applicators; and tree trimmers and pruners; (3) utilities meter readers; couriers and messengers; and Postal Service mail carriers; (4) farming, fishing, and forestry occupations; (5) construction and extraction occupations; (6) installation, maintenance, and repair occupations; (7) and transportation and material moving occupations. There were 447 000 excluded individuals, which left 2 166 000 individuals who worked indoors.

The 1999 Current Population Survey Tobacco Use Supplement[35] reported 73.9% of Minnesotan indoor workers were already covered by smoke-free workplace policies. We thus estimated the number of Minnesotan indoor workers who were not working in a smoke-free workplace to be 565 000. On the basis of a 22.2% smoking prevalence, there were 125 000 smokers who worked indoors and were not covered by a smoke-free workplace policy.

A meta-analysis estimated that implementing smoke-free workplaces would produce an absolute smoking prevalence reduction of 3.7%, and this effect would occur quickly after implementation of the policy.[4] In accordance with Minnesota smoking rates, a smoke-free workplace policy would lead to a 16.7% decline (3.7%÷22.2%) in indoor workers who smoked. This decline would include quitters who would have quit regardless of a smoke-free workplace policy. Previous studies have estimated this background quit rate to be 2.5% per year.[28,29] We assumed smokers who were working without smoke-free workplace coverage would be more similarly motivated, like the general population, than smokers to seek out free NRT. A smoke-free workplace policy would thus lead to an additional 14.2% (16.7%–2.5%) in the quit rate among indoor workers who smoked. We assumed that the rate of compliance with smoke-free workplace policies would be 90%[36] and that 35% of all quitters would relapse.[30,31] (This assumption may have overstated the relapse rate, because smoke-free workplaces probably support continued cessation by removing opportunities and cues for smoking.) The total number of quitters generated was equal to 14.2% of 125 000 multiplied by 90% and multiplied again by 65%, or 10 400 quitters. The QALYs gained by smoking cessation were estimated with the same method as the free NRT program.[33,34]

Cost of a Smoke-Free Workplace Policy

There are 2 considerations when implementing statewide smoke-free workplaces: enactment of the policy in the face of well-organized opposition,[6–11] and implementation and enforcement costs. Because Minnesota had never had a statewide 100% smoke-free workplace policy, we estimated these costs by examining estimates from other states and then extrapolating them to Minnesota on the basis of per-capita costs.

We estimated enactment costs by examining the costs of running a smoke-free workplace policy campaign in Florida, which was comparable to Minnesota: Florida had a smoke-free workplace coverage rate of 68.4% compared with 73.9% in Minnesota in 1999,[35] and the smoking prevalence in Florida was 22.5% compared with 22.2% in Minnesota in 2001.[20]

In 2002, the voters in Florida passed a state initiative that made workplaces, with the exception of some bars, smoke-free. The cost of the campaign to enact this law by popular vote was $5.8 million over a 3-year period (2000–2002) (R.A. DiVitto, written communication, September 2, 2003), including the costs of personnel, office expenses/collateral materials, legal services, public opinion research, paid petition gathering, and paid media.[37] We converted this cost to a per capita basis with the 2001 Florida population estimate (16 355 193),[19] and with the 2001 Minnesota population estimate (4 985 202),[19] we extrapolated a $1.8 million cost for enactment. There are 2 reasons why this cost estimate was likely an upper bound for Minnesota: (1) the Florida initiative was an amendment to the state constitution, which likely increased the overall costs of the campaign, and (2) a Minnesota enactment campaign would consist of local campaigns rather than a state campaign, because Minnesota does not have a state initiative process. The cost of running a statewide election campaign would probably exceed that of advocacy campaigns directed at local legislative bodies.[8–10]

Enforcement of smoke-free workplace policies is usually self-regulated by workers, with moderate enforcement efforts by health authorities.[10] Media campaigns are often used by public health tobacco control programs in other states to reinforce the benefits of maintaining a smoke-free workplace. We estimated the yearly cost of such a media campaign by examining 2001 media campaign expenditures for the state of California (Florida's expenditure information was not yet available). Although California had more smoke-free workplace coverage (76.9%)[35] and a lower smoking prevalence (17.2%)[20] than Minnesota did, we used California's media campaign expenditures because California already has implemented a statewide smoke-free workplace policy, and California's environmental tobacco smoke media campaign efforts are targeted at maintaining rather than initiating a statewide smoke-free workplace policy.

In 2001, California's tobacco control program spent $45 264 000 on media campaigns.[38] We converted this cost to a per capita basis with the California 2001 state population estimate (34 533 054),[19] and with the 2001 Minnesota population estimate (4 985 202), we extrapolated a $6.5 million cost for enforcement. This cost estimate also was likely an upper bound for Minnesota, because California media campaign expenditures were spent not only on smoke-free workplace maintenance programs but also on programs that discourage teen smoking initiation and programs that educate the public about tobacco-related health harms. Our estimated cost of a statewide smoke-free workplace policy was the sum of the cost of an implementation campaign ($1.8 million) and the 1-year cost of a media enforcement campaign ($6.5 million), which totaled $8.3 million. These costs were likely overestimates, because they were based on high-cost models; for the sake of conservatism, we used these costs in our results.

TABLE 1—Initial Parameters of the Monte Carlo Simulation

Key Assumptions	Baseline ±SD
Smoking prevalence[20]	0.222 + 0.015
Proportion of indoor workers covered by smoke-free workplace policies[35]	0.739 + 0.012
Absolute smoking prevalence reduction among indoor workers generated by smoke-free workplace policies[4]	0.037 + 0.005
Workplace noncompliance with smoke-free workplace policies[36]	0.100 + 0.025
Background quit rate[29]	0.025 + 0.008
Relapse rate[31]	0.035 + 0.100
Proportion of smokers in either precontemplative or preparation stage[23]	0.640 + 0.075
Proportion of smokers interested in using NRT if free[23]	0.800 + 0.075
Proportion of heavy smokers[26]	0.549 + 0.001
Odds ratio of quitting with NRT[27]	1.71 (1.56, 1.87)[a]
Baseline quit rate for smokers in precontemplative or preparation stage[27]	0.106 + 0.004
Smoke-free workplace policy enactment cost, millions	$1.770 + $0.883
Smoke-free workplace policy enforcement cost, millions	$6.530 + $3.270

Note. NRT = nicotine replacement therapy.
[a]Odds ratio reported with 95% confidence intervals in parentheses.

Sensitivity Analysis

We performed calculations for 3 alternative scenarios that tested assumptions made in the cost-effectiveness analysis. In the first scenario, the free NRT program was provided only to heavy smokers. In a second scenario, light smokers experienced full cessation benefits after receiving NRT without suffering adverse effects from excess nicotine. The third scenario assumed a low compliance (50%) with smoke-free workplace policies.

We performed a Monte Carlo simulation (SimTools; Chicago, Ill; available at http://home.uchicago.edu/~rmyerson/addins.htm) to estimate the distribution of the costs and benefits of both programs; 10 000 trials were generated. Individual parameters that varied simultaneously in the simulation (Table 1) included the smoking prevalence, the percent of indoor workers covered by smoke-free workplace policies, the effect of smoke-free workplace policies on quitting, the smoke-free workplace compliance percentage, the background quit rate for smokers, the rate of quitter relapse, the percentage of smokers who were contemplative or in preparation of quitting, the percentage of smokers who would use NRT if it were free, the percentage of heavy smokers, the odds ratio of quitting with NRT, the baseline quit rate for smokers who were contemplative or in preparation of quitting, and the enactment and enforcement costs for a smoke-free workplace policy. Normal distributions were used, except for relative risks, which had a log-normal distribution.

RESULTS

When we assumed only heavy smokers would receive a cessation benefit from NRT, a free NRT program that distributed NRT to all smokers who were interested in quitting generated 18 500 quitters at a cost of $130 million, or a cost per quitter of $7020 (Table 2). The equivalent cost per QALY was $4440. Implementing a statewide smoke-free workplace policy generated 10 400 quitters at a total cost of $8.3 million, or a cost per quitter of $799 (Table 3). The equivalent cost per QALY was $506.

Sensitivity Analysis

Table 4 shows our sensitivity analysis results. Limiting the free NRT program only to heavy smokers generated 18 500 quitters and reduced the cost of the program to $70.2 million, a cost per quitter of $3790 and a cost per QALY of $2400. Similarly, if all light smokers received the same smoking cessation benefit from NRT as heavy smokers did, the number of quitters increased to 33 800, and the cost of the program was slightly reduced to $128 million. This scenario generated a cost per quitter of $3790 and a cost per QALY of $2400. When compliance with smoke-free workplace policies dropped to 50%, the number of quitters generated dropped to 5770, but there was no change in costs. The increased cost per quitter was $1440, and the equivalent cost per QALY was $910.

Our Monte Carlo simulation showed overlap in the confidence intervals of our quitter estimates for both a free NRT program and a smoke-free workplace policy; however, there was no overlap in our cost or cost-effectiveness ratio estimates.

DISCUSSION

Our analysis only provided 1-year projections; it was difficult to make projections for longer time periods. Current literature cannot answer how many additional quitters would be generated from long-term implementation of smoke-free workplace policies or how many individuals

TABLE 2—Cost-Effectiveness of a Free Nicotine Replacement Therapy (NRT) Program: Minnesota 2001

Effectiveness of Free NRT Program	Value
Smoker population	825 000
Smokers who want to quit, %	64
Smokers who would use free NRT, %	80
Smokers who previously used NRT in a quit attempt, %	15
Total expected new users of free NRT	359 000
Smokers who smoke > 15 cigarettes/day, %	54.9
Total expected users who can benefit from free NRT	197 000
Increase from baseline quitting with NRT use, %	7.5
Relapse rate, %	35
Maximum quit attempts per year	2
Total quit attempts in 1 year	703 000
Total expected quitters from free NRT program	18 500
Cost of free NRT program	
NRT cost per quit attempt	$185
Total cost of free NRT program	$130 000 000
Cost effectiveness of free NRT program (cost per quitter generated)	$7020
Cost effectiveness of free NRT program (cost per QALY generated)	$4440

Note. QALY = quality-adjusted life years.

TABLE 3—Cost-Effectiveness of a Smoke-Free Workplace Policy: Minnesota 2001

Effectiveness of Smoke-Free Workplace Policy	Value
Smoker population	825 000
Number of indoor workers	2 170 000
Indoor workers without smoke-free workplace coverage, %	26
Smoking prevalence, %	22
Total indoor workers without smoke-free workplace coverage who currently smoke	125 000
Absolute prevalence reduction in smoking after smoke-free workplace policy introduction, %	3.7
Indoor workers who currently smoke who would quit after smoke-free workplace policy introduction, %	14
Noncompliance rate with smoke-free workplace policy, %	10
Relapse rate, %	35
Total quitters after smoke-free workplace policy introduction	10 400
Costs of smoke-free workplace policy	
Cost of implementation campaign	$1 770 000
Cost of media enforcement campaign	$6 530 000
Total	$8 300 000
Cost effectiveness of smoke-free workplace policy (cost per quitter generated)	$799
Cost effectiveness of smoke-free workplace policy (cost per QALY generated)	$506

Note. QALY = quality-adjusted life years.

would continue repeating NRT despite multiple failures.

Our estimates of smoke-free workplace policy costs were limited by the use of single estimates for both enactment and enforcement costs. We attempted to address this in our Monte Carlo simulation through standard deviations equal to half of our cost estimates. Although this choice was arbitrary, our findings were not sensitive to this level of uncertainty. Another limitation was our underestimation of the costs of a free NRT program when we assumed costless distribution and promotion.

Our analysis only compared the number of quitters generated directly by the 2 policy options. It did not account for consumption reductions by the remaining smokers that were the result of either policy. Our smoke-free workplace policy estimates did not account for the reduction in passive smoking exposure among nonsmoking indoor workers, which is another substantial benefit of smoke-free workplaces,[34] or the additional benefits that media campaigns have on nonindoor workers, such as prevention of smoking initiation, and smoking cessation among other populations.

We based our NRT analysis on data from clinical trials; the smoker populations in these trials would likely differ from those smokers who would participate in a free NRT program. For example, clinical trial populations would be less likely to include individuals who have comorbid mental illness or substance abuse problems, and smoking is highly prevalent among these individuals. How they would respond to NRT is unclear.

Smoke-free workplace coverage varies by occupation; blue-collar and service workers are more likely to smoke and to have lower rates of workplace coverage compared with white-collar workers.[39] Smoke-free workplaces also cause greater reductions in smoking prevalence among blue-collar and service workers compared with white-collar workers.[40] We may have underestimated the effect of a statewide smoke-free workplace policy because its cessation effect was based on white-collar worker data, but a larger proportion of the affected individuals would have been blue-collar and service workers.

The combination of low NRT cost estimates and high smoke-free policy cost estimates suggests that our results probably understated the magnitude of the difference in cost-effectiveness between these 2 interventions.

A free NRT program and a statewide smoke-free workplace policy were both cost-effective compared with common standards applied to clinical interventions. The standard threshold for cost-effectiveness for medical interventions was $50 000 per QALY generated[41]; both programs fell well below this threshold, even when key assumptions of light-smoker NRT benefit and smoke-free workplace policy compliance were varied. Although a free NRT program would have generated more quitters than a statewide smoke-free workplace policy would have, it

TABLE 4—Sensitivity Analysis

	Smoke-Free Workplace Policy			Free NRT Program			
	Simulation Results[a]	90% Effective[b]	50% Effective	Simulation Results[a]	All Smokers Participate; Only Heavy Smokers Benefit[b]	Targeted to Heavy Smokers Only	All Smokers Participate and Benefit
Induced quitters	10 200 (6020–15 500)	10 400	5770	18 400 (11 200–28 500)	18 500	18 500	33 800
Cost, millions	$8.3 ($1.7–$14.8)	$8.3	$8.3	$130 ($91.5–$178)	$130	$70.2	$128
Cost-effectiveness ratio (cost per quitter)	$801 ($158–$1770)	$799	$1440	$7000 ($5220–$10 200)	$7020	$3790	$3790
Cost-effectiveness ratio (cost per QALY)	$507 ($100–$1120)	$506	$910	$4430 ($3300–$6440)	$4440	$2400	$2400

Note. NRT = nicotine replacement therapy; QALY = quality-adjusted life years.
[a]Medians are reported (the 2.5% and 97.5% points are in parentheses).
[b]Base case scenario.

did so at more than 15 times the overall cost and nearly 9 times the cost-effectiveness ratio. Of note, our Monte Carlo simulation suggested that a free NRT program might not always generate more quitters than a statewide smoke-free workplace policy. While our cost-effectiveness estimates for free NRT program were similar to other estimates in the literature regarding the cost-effectiveness of NRT,[30,31,42] recent evidence questions the effectiveness of NRT for long-term successful cessation.[25] Combined with our conservative cost-effectiveness estimates for a smoke-free workplace policy, the true differences in cost-effectiveness ratios may be even wider.

CONCLUSION

Implementing smoke-free workplace policies was more cost-effective than our alternative free NRT program scenarios. Although a program targeted at heavy smokers would nearly halve the medication costs, and the quitters generated would nearly double if light smokers benefited fully from NRT, both alternative scenarios would remain nearly 5 times more expensive per quitter than a smoke-free workplace policy.

While the results of our analysis show that smoke-free workplaces are a more cost-effective method for reducing smoking, NRT should be recommended in both clinical practice and public health practice. However, the results of our cost-effectiveness analysis suggest that smoke-free workplace campaigns should be a priority for public health programs, even when the primary goal is to help people stop smoking. ■

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Contributors

M.K. Ong contributed to the design and the analysis of this study. S.A. Glantz contributed to the design of this study.

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No institutional review board approval was needed for this study.

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